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**United States Department of Agriculture
Animal and Plant Health Inspection Service
Program Aid No. 1790**

Center for Plant Health Science and Technology:

An Overview





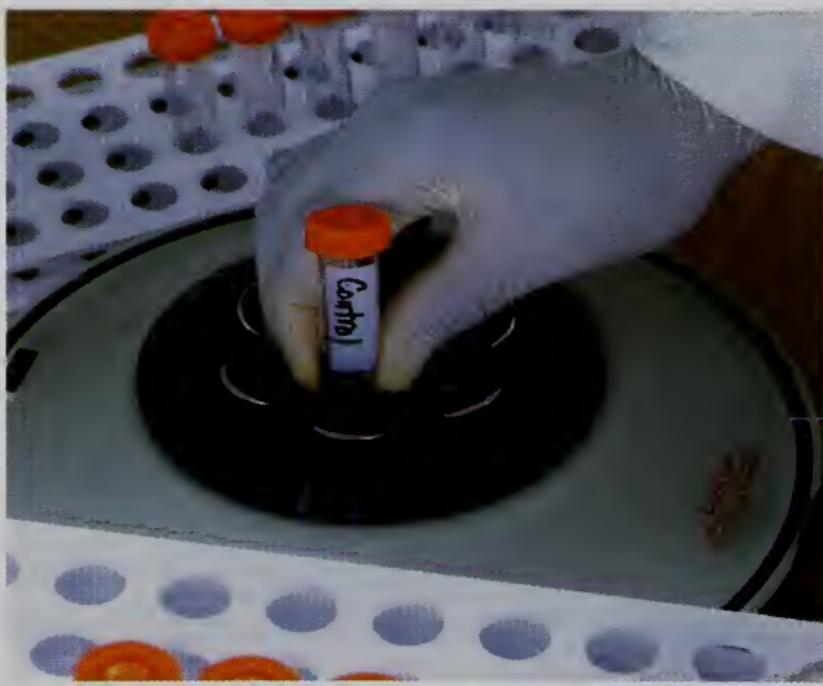
What Is CPHST?

The Center for Plant Health Science and Technology (CPHST) is the scientific support organization for the Plant Protection and Quarantine (PPQ) division of the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS).

CPHST works to identify and evaluate pathways of introduction of invasive plant pests and weeds. Additionally, CPHST assesses the risks these organisms pose to food, fiber, and the environment. By developing, adapting, and supporting technology to detect, identify, and mitigate the impact of invasive organisms, CPHST helps to ensure that the methods, protocols, and equipment used by PPQ field personnel are effective and efficient.

All the work of CPHST is identified under one of five program areas: Agricultural Quarantine Inspection and Port Technology (AQIPT), Integrated Pest Management and Eradication (IPME), Molecular Diagnostics and Biotechnology (MDB), Risk and Pathway Analysis (RPA), and Survey Detection and Identification (SDI).

CPHST is headquartered in Raleigh, NC, on the Centennial Campus of North Carolina State University.



The National Plant Germplasm and Biotechnology Laboratory in Beltsville, MD, develops biotechnology to detect, identify, and differentiate plant pathogens of quarantine significance.

CPHST Laboratories

CPHST employs about 250 scientists and support staff at 9 laboratories and 7 stations in the United States and Guatemala. The scientists are leaders in various fields, including integrated pest management, pest detection and survey, weed control, molecular diagnostics, risk assessment, methods and treatment, and the mass-rearing of insects.

National Weed Management Laboratory (NWML) Fort Collins, CO

Director: Richard Hansen

NWML and the Albany Plant Protection Station (Albany, CA) are leaders in developing methodologies and technologies to control invasive weeds. NWML researches the chemical and biological control of invasive weeds such as toadflax and leafy spurge. Additionally, the Albany Plant Protection Station is developing artificial diets to mass-produce natural enemies used in biocontrol of noxious weeds.



At the National Weed Science Laboratory in Fort Collins, CO, CPHST scientists develop methods to control exotic invasive weeds such as Canada thistle.

(Agricultural Research Service file photo.)

**Decision Support and Pest Management Systems Laboratory (DSPMSL)
Phoenix, AZ**

Director: Robert Staten

DSPMSL works with universities, private industry, and USDA's Agricultural Research Service to develop biologically based pest management. The lab utilizes biorational technology for the control of pests, including the use of sterile insect technology and genetically transformed insects and the application of chemicals in highly targeted systems.

Fruit Fly Genetics and Management Laboratory (FFGML) Waimanalo, HI

Director: Sue McCombs

FFGML and its stations in Gainesville, FL, and Guatemala City, Guatemala, work to improve the standards and quality of the mass-production of fruit flies. Projects include improving the mating competitiveness of mass-reared flies, stabilizing the production of the temperature-sensitive lethal genetic sexing strain of the Mediterranean fruit fly, and developing novel genetic strains to enhance control measures.



The Fruit Fly Genetics and Rearing Laboratory in Waimanalo, HI, works to improve methods of mass-rearing sterile insects for use in several control programs. This photo shows a sterilized Mediterranean fruit fly.

**National Plant Germplasm and Biotechnology
Laboratory (NPGBL)
Beltsville, MD**

Director: Laurene Levy

NPGBL validates polymerase chain-reaction methods to detect plant pathogens. Additionally, the laboratory is developing rapid-response technology that can be deployed in the field and at U.S. ports-of-entry. NPGBL is a primary facility for molecular diagnostics for emergency response programs and indexing of exotic germplasm.

**Pest Detection, Diagnostics, and Management
Laboratory (PDDML)
Mission, TX**

Director: Paul Parker

The primary mission of PDDML is to identify and develop technologies to control agricultural and environmental pests. Projects include mass-producing and releasing biocontrol agents and providing geographic information system (GIS) support for various emergency programs. For the Caribbean offshore initiative, PDDML assesses pest threats to the United States and provides methods to assist survey, identification, and management.



The Pest Detection, Diagnostics, and Management Laboratory in Edinburg, TX, develops technologies to mass-rear biological control agents, such as the giant salvinia weevil.

Pest Survey Detection and Exclusion Laboratory

(PSDEL)

Otis ANGB, MA

Director: Vic Mastro

PSDEL develops treatments, trapping technology, and biologically based management strategies for various invasive pests, particularly forest pests. Additionally, PSDEL scientists develop and evaluate new commodity treatment schedules that provide alternatives to the use of methyl bromide and work to improve existing treatments.

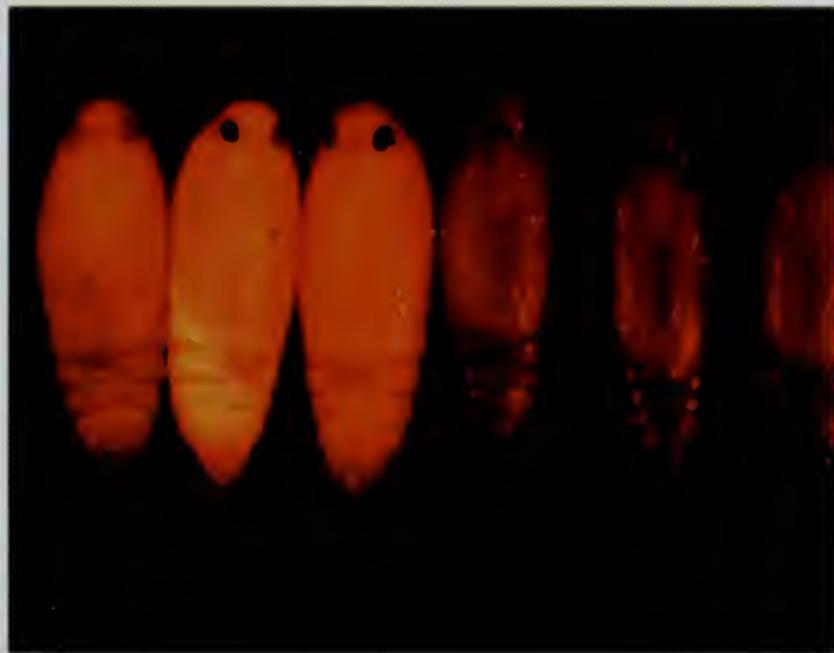
Plant Epidemiology and Risk Analysis Laboratory

(PERAL)

Raleigh, NC

Director: Robert Griffin

PERAL applies risk-analysis methodologies to safeguard natural biological systems and agriculture. Projects include analyzing offshore pest dynamics and identifying agroenvironmental pests of greatest concern, evaluating potential pathways for the introduction of harmful exotic pests, identifying measures to eliminate or reduce the risk of pest introduction, and developing technology applications and strategies for protecting imports and exports from pest threats.



At CPHST's Decision Support and Pest Management Systems Laboratory in Phoenix, scientists are working on developing transgenic pink bollworm lines for future eradication programs.

Treatment Quality Assurance Unit (TQAU) Raleigh, NC

Director: Scott Wood

TQAU provides scientific support for Quarantine Policy Analysis and Support, enhances responsiveness to APHIS emergency programs, supports the PPQ Treatment Manual, and increases CPHST's ability to respond to port technology needs. Additionally, the unit provides treatment support, as well as facility, vessel, and container certification, onsite training, and site assistance.



The Treatment Quality Assurance Unit in Raleigh, NC, develops methods and protocols for treating commodities so they are safe to enter the United States.

**Analytical and Natural Products Chemistry
Laboratory (ANPCL)
Gulfport, MS**
Director: John Gallagher

ANPCL provides expertise in analytical chemistry to support PPQ programs to eradicate or control invasive species with chemical treatments. Additionally, the lab synthesizes pheromones and insect attractants needed by other CPHST laboratories to develop trapping technologies for invasive species. ANPCL personnel are also involved in developing methods of detection, regulation, and control of soil-inhabiting pests, particularly the imported fire ant.



CPHST's Pest Survey Detection and Exclusion Laboratory at Otis, MA, develops methods for controlling and eradicating forest pests, such as the emerald ash borer.

Contact Information

Center for Plant Health Science and Technology
USDA-APHIS-PPQ
1730 Varsity Drive, Suite 400
Raleigh, NC 27606-5202
Phone: (919) 855-7400
Fax: (919) 855-7477

Director's Office Contacts

Gordon Gordh, Ph.D.
Director, CPHST
E-mail: gordon.gordh@aphis.usda.gov
Phone: (919) 855-7400

Alan K. Dowdy, Ph.D.
Associate Director, CPHST
E-mail: alan.k.dowdy@aphis.usda.gov
Phone: (919) 855-7400

E-mail CPHST: CPHST@aphis.usda.gov



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Cover photo: CPHST scientists engage in many different activities to protect American agriculture.

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